UNIT 13 COMPUTER MAINTENANCE AND TROUBLESHOOTING

Structure

13.1 INTRODUCTION

Computer maintenance refers to the physical processes of upkeep of the peripherals. Maintenance activities like regular brushing, dusting, vacuum cleaning etc. are the important and mostly ignored preventive measures.

Regular maintenance generally takes care of most of the problems especially those of data loss or corruption. So it should be given due importance.

Troubleshooting is isolating the source of a problem and fixing it. In the case of computer systems, the term troubleshoot is usually used when the problem is suspected to be hardware related. If the problem is known to be in software, the term debug is more commonly used. Troubleshooting covers both hardware and software.

Hardware troubleshooting includes removing the problems when the hardware devices as mouse, monitor, printer, modem etc. malfunction.

Software troubleshooting includes removing problems encountered while working with Operating System. It also includes the most threatened problem of viruses.

13.2 OBJECTIVES

After going through this unit, you will be able to:

● discuss the various system tools for computer maintenance, and

● Enlist troubleshooting tips for software and hardware.

13.3 COMPUTER MAINTENANCE

Computer, like any other commodity, demands proper maintenance. You must take some desired steps, every couple of weeks, so that your computer remains in good condition.

These are some of the basic things if done properly can increase the life of your computer and can lead to a smooth experience with your computer system.

Useful Maintenance Tips to Keep Your Windows Computer in Shape

● Keep Your **Computer Dust Free**

● Use a Fan to Cool Your Laptop

● Always Update **Windows**

● Erase Your **Computer's** Temporary Files

● Uninstall Unnecessary **Software**

● Remove Unnecessary Startup Programs

● Run Virus Scans Regularly

Defragment& Optimize Drive

When we install any software or create a file or folder, it is stored on the hard disk. Now it might be possible that these files are not stored in one sequence but are broken into many segments and then stored. This is because the file might be too big to be stored in one empty space on the hard disk.

Defragment & Optimize Drive is a tool that puts all of your files back into place (see Figure 1). It rearranges all the files so that each file is stored in one sequence. This results into the programs running faster.

Windows 10, automatically defragments files for you on a schedule (by default, once a week). However, it doesn't always run consistently.
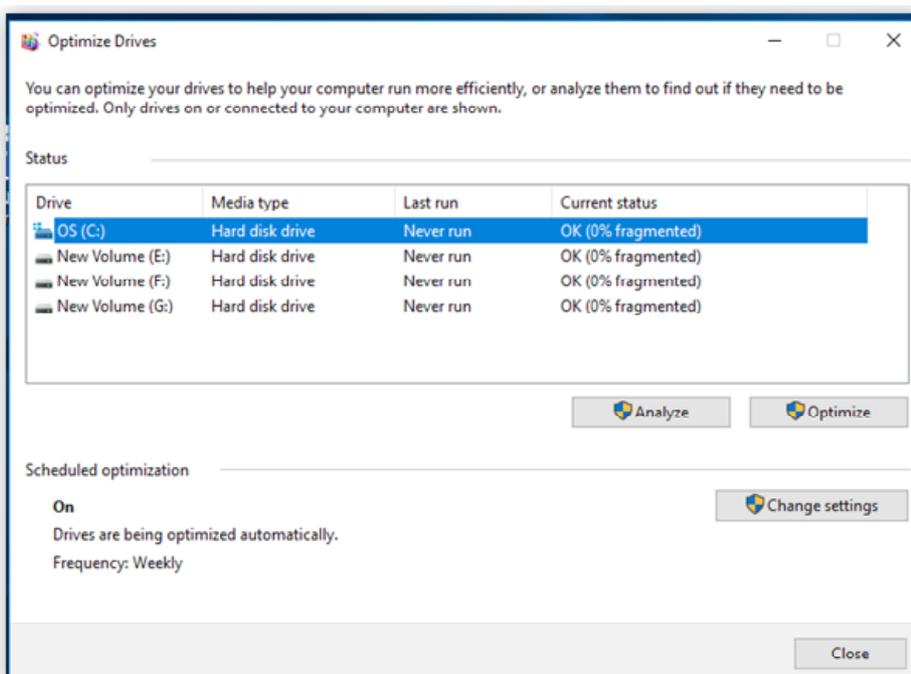

Fig. 13.1: Defragment & Optimize Drive tool

Disk Cleanup

Disk Cleanup is a computer maintenance utility included in Microsoft Windows designed to free up disk space on a computer's hard drive. The hard disk contains many files that are unnecessary after a certain amount of time, but they still reside on the disk. These need to be removed manually or an automatic Disk Cleanup program can be scheduled as shown in the Figure 13.2.
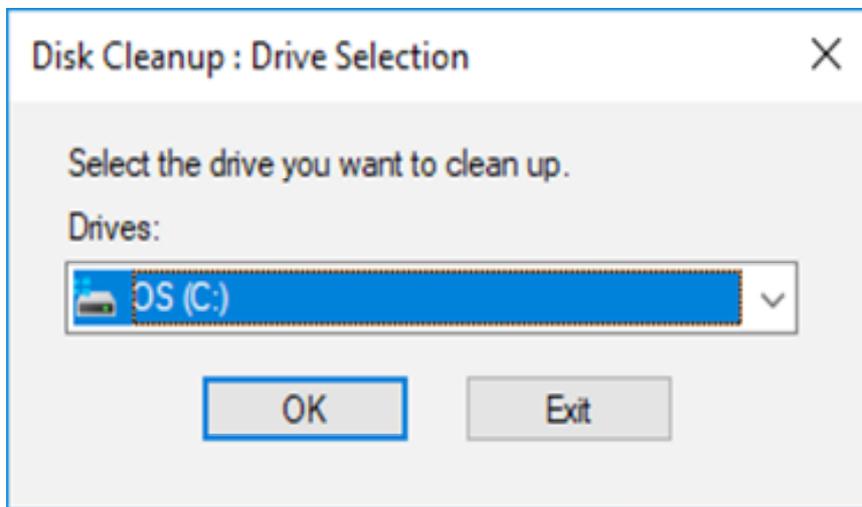

Fig. 13.2: Disk Cleanup tool

Disk Cleanup will delete all of your unused and unwanted files. It will also delete your garbage and old Internet files. The disk cleanup operation should be performed weekly.

Windows Update

Windows update will ensure that your computer is up-to-date with new features and the latest security. This feature needs a connection to the Internet. It connects to the Micro softserver and downloads and installs the updates on the system.

Windows updates are most easily installed using the Windows Update service. While you could certainly download updates manually from Microsoft's servers, updating via Windows Update is considerably easier to do.

In Windows 10, downloading and installing updates is automatic and will happen immediately after checking or, with some updates, at a time when you're not using your computer.

You can click on the Windows Update icon in the start menu and click on the download up date to get the updates.

Task Manager

Sometimes there are programs that we do not want to run anymore or programs that gethalted due to some problem. Although the best way to close a program is to choose the 'Close' or 'Exit' command from the 'File' menu but there is another way of closing it.
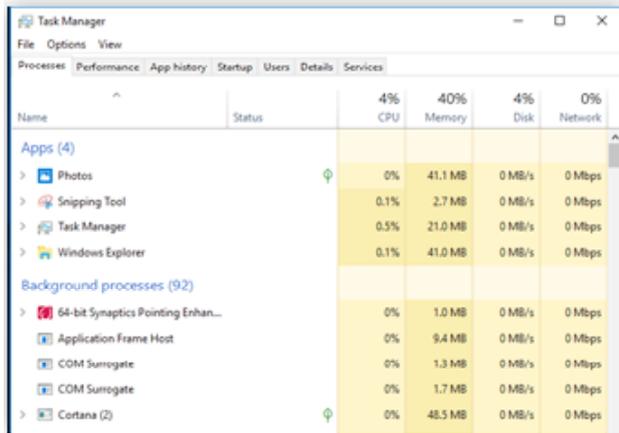
Fig. 13.3: Task Manager

Pressing 'Ctrl+Alt+Delete' keys simultaneously brings up the Task Manager's **Applications** tab. You can close the program which is not responding by pressing 'End Task' button as can be seen in Figure 13.3. The program is closed at once.

System Restore

System Restore is a system tool that is used to create a new Restore point or to restore the system to a previous restore point. It makes a secure copy of the system settings when it is functioning normal, which is useful in case system malfunctions.

System Restore is like a time machine that allows you to undo system changes that may be causing problems. Whenever we install new software, it is always advisable to save the setting of the system so that at later stage if the system malfunctions then that saved copy of the system, made when it was working normally, can be restored. It helps in getting the system up and running for use.

On Windows 10, System Restore is a feature designed to create a snapshot of your device and save its working state as a "restore point" when system changes are detected.
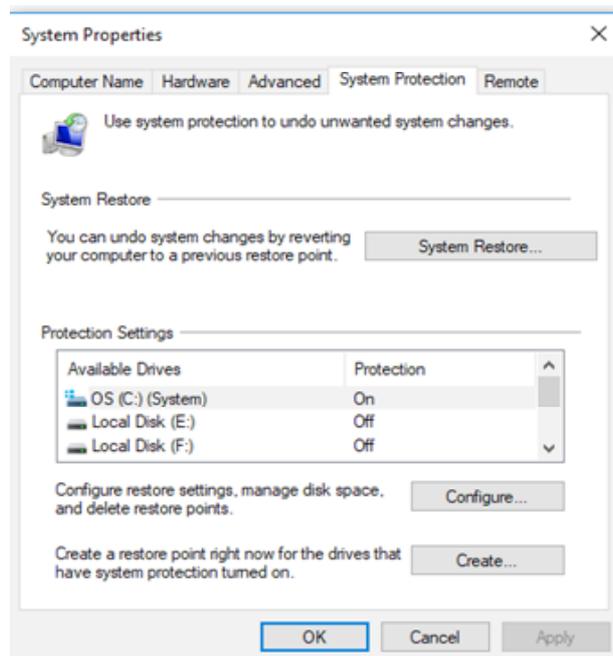

Fig. 13. 4: System Restore

To make a restore point, choose the System Restore option from the Control Panel->System & Security->System->System Protection->System Restore.

To restore the system to a previous restore point, follow the same steps, but just choose restore rather than making a new restore point.

Common problems and solutions

- For **Slow computer**, you can use the following methods:

  - Disk Cleanup

  - Defragment & Optimize Drive

  - Close unwanted programs

  - Run Antivirus program

  - Free up hard disk space

  - Run fewer programs at the same time

- For **Frozen screen**, you can use the following methods:

  - Use Task Manager to Close programs these are not responding

  - System restore

  - Restart your computer

13.4   SOFTWARE TROUBLESHOOTING

Software troubleshooting is the process of scanning, identifying, diagnosing and resolving problems, errors and bugs in software.

Options to Use When a System Will Not Start

Operating System provides following options to use when a system will not start:

- The first options to try are safe mode and related startup options, which you can use to start the system with only the minimal necessary services. Safe mode options, including Last Known Good Configuration, are especially useful if a newly installed driver is causing problems while starting the system. Safe Mode starts the operating System using basic files and drivers only. The drivers and files used for mouse, monitor, keyboard, mass storage, base video, and default system services are loaded only.

- If safe mode and the Recovery Console are not workable in your situation, you can try re-running Setup from the Operating System CD-ROM. Setup might be able to repair the system, although some settings could be lost.

Device Driver Problems

System problems can result if you add a new device and/or device driver file that are incompatible with Operating System. They can causes problems during startup.

Preventing problems

- Check the Hardware Compatibility List before installing a new device or device driver on their vendor website.

- Read your hardware documentation for compatibility and configuration information.

- Obtain the latest device driver file from the device manufacturer.

Recovery Methods

- Restart the computer using safe mode, Last Known Good Configuration.

- Try to obtain a functional copy of the device driver so that you can uninstall the device and then reinstall with the new driver.

Preventing or Recovering from Damaged Important Files

If certain types of files are damaged or corrupted, system problems can result. These types of files are:

- Device drivers

- Registry files

- System files

- Other files required for normal startup

Preventing problems

- Protect the computer against power surges and failures, which can damage files when they are being written to the hard disk.

- Before installing or implementing unusual device configurations, drivers, or registry settings, obtain detailed information from the device manufacturer.

- Perform regular backups, including System State backups.

Recovery methods

- Restart the computer using safe mode, Last Known Good Configuration.

- Restore the System State from a recent backup, or use the Recovery Console to replace a damaged file with a clean copy.

Viruses

A computer virus is a type of malicious software that, when executed, replicates itself by modifying other computer programs and inserting its own code.

A virus can be spread by opening an email attachment, clicking on an executable file, visiting an infected website or viewing an infected website advertisement. It can also be spread through infected removable storage devices, such USB drives. Once a virus has infected the host, it can infect other system software or resources, modify or disable core functions or applications, as well as copy, delete or encrypt data.

Malware also, is a malicious software intentionally designed to cause damage to a computer, server, client or computer network. Malware does the damage after it is implanted in some way into target's computer. Some kinds of malwar are largely referred to as worms, Trojan horses, spyware, among other terms.

Preventing Virus Problems

- Install Anti-Virus/Malware Software.
- Run Regularly Scheduled Scans with Your Anti-Virus Software.
- Keep Your Anti-Virus Software Up to Date
- Keep Your Operating System Current
- Secure Your Network.
- Do not click on a link in an unsolicited email.
- Use Multiple Strong Passwords.
- Back Up Your Files.

Other Things to Consider

- Obtain software only from trusted sources.
- Use a safe Web browser and e-mail client.
- Scan all newly obtained disks, programs and files.

ETHICAL TIPS

There are some of the rules that everyone should abide by while using computer and any other related device or technology.

- Should not use computer to harm any person; interfere with his work and use other person's computer resources without proper authorization or compensation.
- Should not design or write a system or program without thinking about its social consequences.
- Should always use computer in ways that ensure consideration and respect for fellow humans.
- Should not use computer to steal information of others.

13.5 HARDWARE TROUBLESHOOTING

Hardware troubleshooting is the process of reviewing, diagnosing and identifying operational or technical problems within a hardware device or equipment. It aims to resolve physical and/or logical problems and issues within a computing hardware.

No-Input Signal to a Computer

If your monitor is displaying "No Input Signal," there is no image displayed from your PC to your monitor. There are several possible causes for this error. Most of the time the problems are with the cables or other attached devices. You must determine which component is defective, ranging from the cables that attach your monitor to your PC to the monitor itself or even your PC's video card.

For this, you can do the following:

● Turn off your computer.

● Unplug the cable running from your monitor to your PC and plug it back. The most common cause of this error is a loose cable.

● If the monitor is still not displaying a signal after reattaching the cable, the problem could lie with the cable.

● Replace your monitor with another monitor if possible. If the "No Input Signal" error still appears, the problem does not rest with the cables or the monitor, but with your PC.

● Now check your video card. Remove the card and insert the video card into another slot on your mother board. Close your PC case and test the monitor again. (This step should be perfomred only if you have basic understanding of cards & slots, else call the service engineer).

● If the "No Input Signal" error still appears. Replace your video card completely. Your video card may suffer from internal damage that is not allowing it to output a signal.

Troubleshooting Printers

When dealing with printing issues, the first step to verify your printer is plugged in, powered on, and connected to your computer. These may seem obvious, but sometimes we forget to check the simple things before checking the more complex ones.

Here are some simple troubleshooting tips for printer.

● Without paper, your printer will not be able to print. Make sure you have loaded paper into the printer tray. Next, verify that no paper is jammed or partially fed into the printer.

● You'll need enough ink (if it's an inkjet printer) or toner (if it's a laser printer) before you can print.

● You may need to install, update, or reinstall the printer drivers if it isn't working properly.

● You can also use Printer troubleshooter tool that is built into Windows.

Troubleshooting Mouse

Following are some simple troubleshooting tips for mouse:

● Check your USB port is working. Plug the mouse into a different USB port.

● When mouse is not working, connect the mouse with a different computer and check it.

● If you are using a cabled mouse, you need to check the wire correctly.

● If still the mouse is not working, you may update your drivers.

● You can also use troubleshooter tool.

● Troubleshooting the mouse comes down to replacement in most case.

Troubleshooting Keyboard

Troubleshooting keyboards is not difficult, but in most of the cases if the problem persists, then it's better to replace it.

- Check your USB port is working.

- If you have spilt a liquid on the keyboard, switch of the computer and remove one key at a time and clean underneath each key.

- If the keys do not strike correctly, make sure that the keyboard is free of dust, dirt, and foreign matter. Turn the keyboard upside down to allow for any foreign debris, such as hair, food particles, or dust, to fall out.

- If keyboard is not sending a signal to the computer. Check connection first. If this seems to be okay then your keyboard may be faulty itself.

- Download and install the latest keyboard software.

- If your keyboard is a constant problem, simply replace it.

13.6   LET US SUM UP

We covered the computer maintenance issues in this Unit. The preventive measures discussed are: Disk Defragmenter, Disk Cleanup, Windows Update, Closing unwanted programs and System Restore. We discussed troubleshooting in the Software as well as the Hardware context. At software level we discussed: Options to use when a system will not start, Device driver problems, Preventing or recovering from damaged important files and Viruses. In similar manner, we discussed troubleshooting at the Hardware level: Monitor, Printer, Mouse and Keyboard.

13.7   CHECK YOUR PROGRESS EXERCISE

1.   What is Debugging?

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2.   What are the computer maintenance issues we should remember to prevent problems?

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3.   How Viruses does pose a risk to the data?

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4. How do we troubleshoot a keyboard?

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5. Go to Windows Administrative tools and run Defragment & optimize drive tool on your hard disk.

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6. Try to explore more about the device driver problems.

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7. Go to the Microsoft's website and study in detail how to troubleshoot various devices.

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13.8 ANSWERS TO CHECK YOUR PROGRESS EXERCISE

1. Debugging is finding and removing errors (bugs) from a program.

2. The computer maintenance issues that should be remember to prevent problems are:

   ● Keep Your Computer Dust Free

   ● Use a Fan to Cool Your Laptop

   ● Always Update Windows

   ● Erase Your Computer's Temporary Files

   ● Uninstall Unnecessary Software

   ● Remove Unnecessary Start up Programs

   ● Run Virus Scans Regularly

3. Viruses may infect (copy to, and spread from), programs in disk sectors etc. The programs waste disk space and memory, delay computer operations and increase the likelihood of system crashes. They function erratically and over write data and cause programs to run erratically.

4. The troubleshooting issues of keyboard are as follows:

- Keep all liquids off the desktop, so that they do not spill on the keyboard. Keyboards in general work well. Sometimes keys and keypad sensors will go bad. This is just normal wear and tear on the keyboard.

- If you have spilt a liquid on the keyboard you have to remove one key at a time and clean underneath them.

- Another common problem is keyboard isn't sending a signal to the computer. Check connection first. If this seems to be okay then your keyboard may be faulty itself.

- If your keyboard is a constant problem simply replace it.

5. This is an exercise for you. Try doing it yourself.

6. This is an exercise for you. Try doing it yourself.

7. This is an exercise for you. Try doing it yourself.